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Japanese Patent

Hei 9-37125

**CAMERA**

[Kamera]

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Claims

1. A camera, characterized by the fact that in a camera that once stores an image electronically introduced into the camera in a storage device and transfers the image to other devices by radio waves, lights, and the likes, it has a power switch that can introduce the image into said camera; and the image can be transferred only when said switch is turned off.

2. The camera of Claim 1, characterized by the fact that the preparation operation of the image transfer is started by interlocking with the operation that turns off the power switch of the above-mentioned camera.

3. A camera, characterized by the fact that in a camera that is equipped with a photoelectric conversion element for introducing a subject image as an electronic image, a storage device for storing the photoelectrically converted image signal, and a transfer device for transferring the image signal stored in said storage device and supplies a power for the above-mentioned each device by a single power supply device, the transfer operation of the image is prohibited before the prohibition of the introduction operation of the image when the

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<sup>1</sup> Numbers in the margin indicate pagination in the foreign text.

remaining amount of battery of the power supply device has been reduced.

4. The camera of Claim 1[sic; 3], characterized by being equipped with a means that discriminates whether or not the battery capacity required for the completion of the transfer operation of said image remains before said image transfer operation and prohibits the transfer operation if it is decided that the capacity is not sufficient.

5. A camera, characterized by the fact that in a camera equipped with a photoelectric conversion element for introducing a subject image, a storage device for storing the photoelectrically converted image signal, and a transfer device for transferring the image signal stored in said storage device, whether or not the transfer of said image is required can be set before the transfer of the image; and only the image in which the transfer requirement is set is transferred in response to the transfer start operation.

6. The camera of Claim 5, characterized by the fact that for the image whose transfer has been completed, a signal for identifying the image transfer completion is added to its file.

7. A camera, characterized by the fact that in a camera equipped with a photoelectric conversion element for introducing a subject image, a storage device for storing the

photoelectrically converted image signal, and a transfer device for transferring the image signal stored in said storage device, when the transfer completion is confirmed in advance before the transfer of said image, whether or not said image file is erased or held as it is can be set.

8. The camera of Claim 7, characterized by the fact that a signal showing whether or not the storage of the file after the above-mentioned image transfer is required can be set in each image file; and the setup can be changed before the image transfer.

#### Detailed explanation of the invention

[0001]

(Technical field of the invention)

The present invention pertains to an electronic camera that introduces an image by using a photoelectric conversion element such as CCD, stores it once, and transfers to other devices.

[0002]

(Prior art)

Lots of proposals that provide an image transmitter to an electronic camera have been made. For example, there are Japanese Kokai Patent Hei 4[1992]-170881, etc., however almost

all of them applied are mainly focused on how to transmit an image introduced into the electronic camera.

[0003]

(Problems to be solved by the invention)

However, in such portable equipments, the portability is an important element, and its miniaturization and lightness have a large effect on the product qualities. In particular, the adoption means of a power source is a very important issue.

[0004] The purpose of the present invention is to provide a camera that is used with good efficient and sufficiently considers the convenience for users to suppress its power source to a small-scale light one.

[0005]

(Means to solve the problems)

In order to achieve the above-mentioned purpose, in the present invention, several functions are operated in a time series to efficiently use batteries. Also, before the start of an image transfer, the batteries are sufficiently checked so that no image may be wasted (if the operation is discontinued halfway, the images transmitted by that time are wasted).

[0006]

(Embodiments of the invention)

As a constitution for realizing the purpose of the present invention, as described in Claim 1, in a camera that once stores an image electronically introduced into the camera in a storage device and transfers the image to other devices by radio waves, lights, and the likes, it has a power switch that can introduce the image into said camera, and the image can be transferred only when said switch is turned off. According to this constitution, the decrease of the power supply voltage can be reduced.

*motivation*

[0007] As a detailed constitution for realizing the purpose of the present invention, as described in Claim 2, the preparation operation of the image transfer is started by interlocking with the operation that turns off the power switch of the above-mentioned camera. According to this constitution, the image transfer can be rapidly carried out.

[0008] As another detailed constitution for realizing the purpose of the present invention, as described in Claim 3, the transfer operation of the image is prohibited before the prohibition of the introduction operation of the image when the remaining amount of battery of the power supply device has been reduced. According to this constitution, the image introduction can be preferentially carried out.

[0009] As another detailed constitution for realizing the purpose of the present invention, as described in Claim 4, whether or not the battery capacity required for the completion of the transfer operation of said image remains is discriminated before the image transfer operation, and the transfer operation is prohibited if it is decided that the capacity is not sufficient. According to this constitution, the decrease of the battery voltage can be prevented.

[0010] As a constitution for realizing the purpose of the present invention, as described in Claim 5, whether or not the transfer of said image is required can be set before the transfer of the image, and only the image in which the transfer requirement is set is transferred in response to the transfer /3 start operation. According to this constitution, only the image whose transfer is required can be transferred.

[0011] As a detailed constitution for realizing the purpose of the present invention, as described in Claim 6, for the image whose transfer has been completed, a signal for identifying the image transfer completion is added to its file. According to this constitution, the transferred image can be identified.

[0012] As a detailed constitution for realizing the purpose of the present invention, as described in Claim 7, when the transfer completion is confirmed in advance before the transfer



of said image, whether or not said image file is erased or held as it is can be set. According to this constitution, the image file is not unnecessarily kept.

[0013] As a detailed constitution for realizing the purpose of the present invention, as described in Claim 8, a signal showing whether or not the storage of the file after the image transfer is required can be set in each image file, and the setup can be changed before the image transfer. According to this constitution, the image file can be reliably kept.

[0014]

(Application examples)

First application example

Figure 1 is a block diagram showing the outline of the present invention. 1 is an image sensor using a photoelectric conversion element such as CCD. 2 is an A/D converter that receives the output from the image sensor 1, appropriately amplifies it, and digitally converts its image signal at good timing. 3 is an image processing circuit that carries out various kinds of processing, such as  $\gamma$  conversion of images, for processing the digitalized image signal with high picture quality and compresses the image signal for storage (for example, according to the standards such as JPEG). 4 is a memory for storing the image signal, for example, IC cards being

used in notebooks, etc. 5 is a device for transmitting the images signals accumulated in the memory 4 and has a part called a modem for modulating the image signals serially read out into signals suitable for transmission and a radio telephone part.

[0015] 6 is a central processing unit in charge of the entire sequence of the camera and is a so-called microcomputer. 7 is a power supply device for supplying a power of this entire camera, turns on and off the power supply, stabilizes the voltage, monitors the remaining amount of battery, etc. 8 is a battery as a supply source of the power. 9 is a power switch of the camera. 10 is an automatic transmission setup switch.

[0016] Figure 2 is a flow chart showing the outline of the operation of the first application example of the present invention. Also, each step is abbreviated to S. First, the photographing operation of the camera is explained. Prior to photographing, the power switch is turned on (S1). A power is supplied to the other circuits except for the transmitter 5, and a photographing preparation operation such as opening of a lens cover is carried out by a mechanism which is not shown in the figure. If a release button is pressed toward a subject being photographed (S2), auto focus, etc., are operated, and an appropriate exposure operation is carried out (S3). Its image signal is digitally converted by the A/D converter 2 from the

CCD 1, processed by the image processing circuit 3, compressed, sent to the memory 4, and stored.

[0017] Then, if necessary, several sheets of images are photographed and respectively stored in the memory 4. The number of images that can be stored in the memory 4 depends on the capacity of the memory being used, and at least about 10 sheets of images can be stored. When the photographing is finished, the power of the camera is turned off (S4). At that time, whether or not the automatic transmission switch 10 is turned on is decided (S5). If it is turned on, the power is introduced into the transmitter 5 by an instruction of the CPU 6, and the image file is automatically transferred by dialing transmission destinations of the image set according to a preset sequence. At that time, the remaining amount of battery required for the transfer is predicted from the capacity of the file to be transferred and the transfer speed of the line and compared with the remaining amount of battery 8 checked when the power is input into the transmitter (S6). If the amount is sufficient for the transfer completion, the image file is transmitted. If it is predicted that the amount is not sufficient for the transfer completion, a transfer impossibility is displayed without dialing (S8), and the processing is finished.

[0018] Second application example

Next, a second application example of the present invention that can select the transfer of a file is explained.

[0019] Figure 3 is an outlined block diagram showing the second application example. The basic constitution is similar to that of the first application example. The difference from the first application example is that a LCD display unit 11 and a mode changeover switch 12 are newly added, and the mode changeover switch 12 is a switch for setting whether or the transmission of the image is required and setting whether or not the file is erased after the transfer. It selects an image from a large amount of images photographed, transfers it, erases the image from the memory after the transfer, and newly introduces the photographed image into the memory, so that photographing is successively enabled. Also, even if a trouble is caused in important photographs, since it can be recovered, the image data is sometimes left in the memory after the transfer.

[0020] Accordingly, in the second application example, whether or not the transfer image is left in the memory can be set by the mode switch 12.

[0021] The operation is explained using a flow chart shown in Figure 4. Prior to photographing, while observing characters being displayed on the LCD display unit 11, whether the file is

erased or left as it is after the image transfer completion is set using the mode switch 12 (S11). Then, the power switch 9 is input (S12), and photographing is carried out similarly to the first application example. Then, while observing the display of the LCD display part (S13), whether or not the transfer of the photographed image is required and whether or not the file storage is required are set using the mode changeover switch 12 (S14). /4

[0022] Next, the power of the camera is turned off (S15), and whether or not the automatic transfer switch 10 of the image is turned on is decided (S16), and at that time, the remaining amount of battery required for the transfer is predicted from the capacity of the file to be transferred and the transfer speed of the line and compared with the remaining amount of battery 8 checked when the power is input into the transmitter (S18). If the amount is sufficient for the transfer completion, the image file is transmitted (S19). Also, if it is predicted that the amount is not sufficient for the transfer completion, the processing is finished. Next, whether or not the file should be erased is confirmed (S20). If the file may be erased, the file is erased (S21), and the processing is finished. A display example of the LCD display 11 at S13 is shown in Figure 5.

[0023] In Figure 5, OX next to counter numerals show whether or not the image transfer is required, and OX next to it shows whether or not it is necessary to finally store the file. For example, the first sheet shows the image is transferred and then stored, the second sheet shows that the image transfer is not required and the file is stored, the third sheet shows that the image is transferred and the file is erased after the completion of the transfer, etc.

[0024] These sheets are preset to initial values, and if they are operated, they are processed as initially set when the power switch is turned off.

[0025]

(Effects of the invention)

As explained above, according to each claim of the present invention, a small-scale power supply device allowed as a portable equipment can be effectively utilized to the maximum, and images can be transferred with good operability. In addition, the memory means for storing the images can also be effectively utilized, so that a small-scale electronic camera can be thoroughly effectively utilized.

[0026] Also, for an efficient use of the battery, several functions can be operated in a time series.

[0027] Furthermore, if the transfer of the images is discontinued halfway, its continuation is difficult, and the possibility that the images sent by that time are useless is large. Accordingly, it is important to sufficiently check the amount of battery before the start and to prevent the uselessness from being caused.

#### Brief description of the figures

Figure 1 is an outlined block diagram showing a first application example of the present invention.

Figure 2 is a flow chart showing the operation flow of the first application example of the present invention.

Figure 3 is an outlined block diagram showing a second application example of the present invention.

Figure 4 is a flow chart showing the operation flow of the second application example of the present invention.

Figure 5 shows a LCD display example of the second application example of the present invention.

#### Explanation of numerals:

- 1     CCD for introducing images
- 2     A/D converter
- 3     Image processing circuit
- 4     Image memory

- 5 Digital signal transmitter
- 6 Microcomputer for control
- 7 Power supply device
- 8 Battery
- 9 Power switch of camera
- 10 Automatic transmission setup switch
- 11 LCD display
- 12 Mode switch

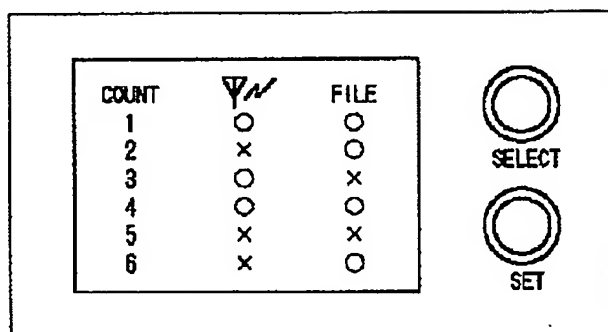


Figure 5



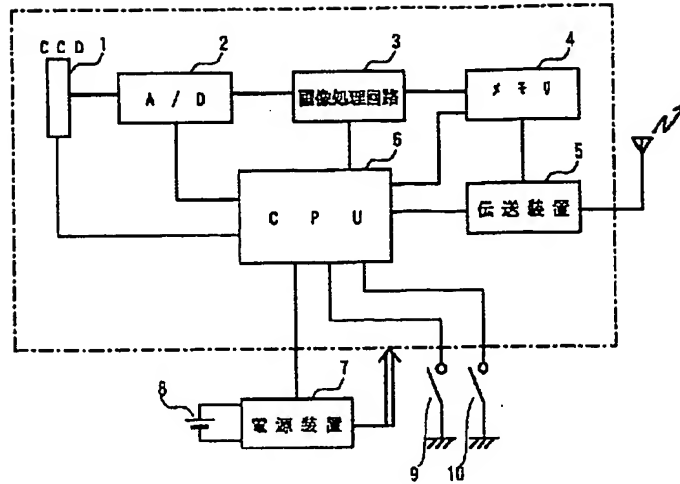


Figure 1:

- 3 Image processing circuit
- 4 Memory
- 5 Transmitter
- 7 Power supply device

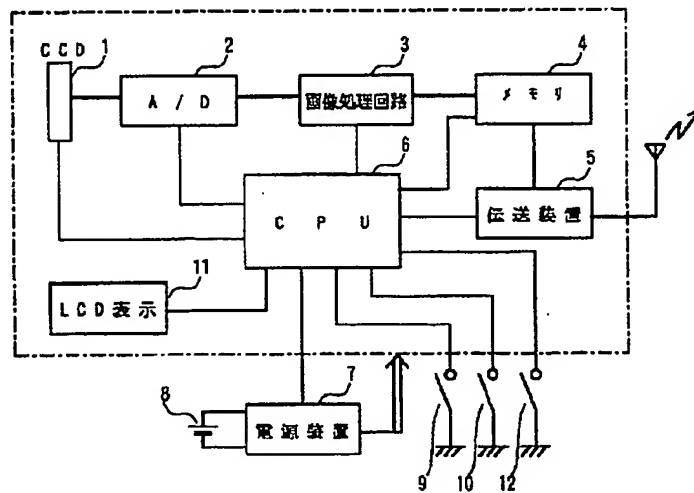


Figure 3:

- 3 Image processing circuit

- 4 Memory
- 5 Transmitter
- 7 Power supply device
- 11 LCD display

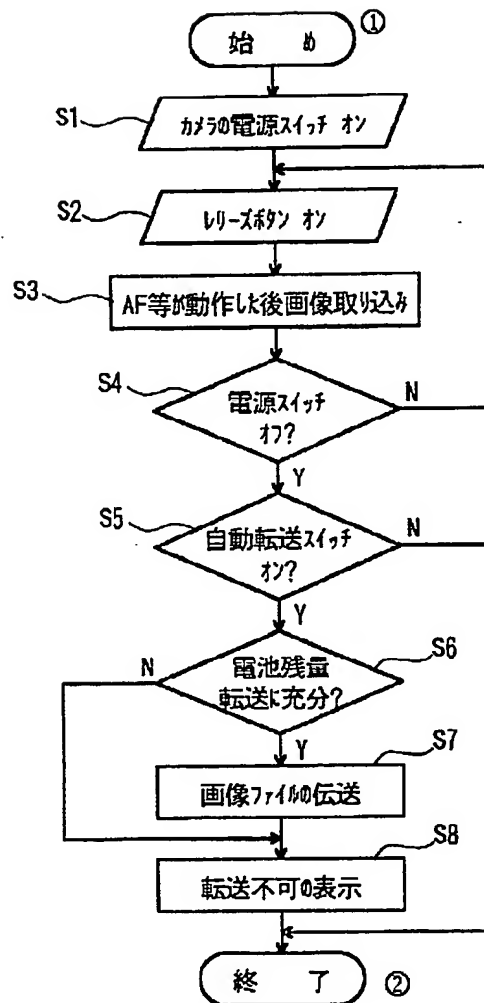


Figure 2:

- 1. Start
- 2. End
- S1 Power switch On of camera

- S2 Release button On
- S3 Image introduction after the operation of AF, etc.
- S4 Power switch Off?
- S5 Automatic transfer switch On?
- S6 Is the remaining amount of battery sufficient for the transfer?
- S7 Transmission of image file
- S8 Display of transfer impossibility

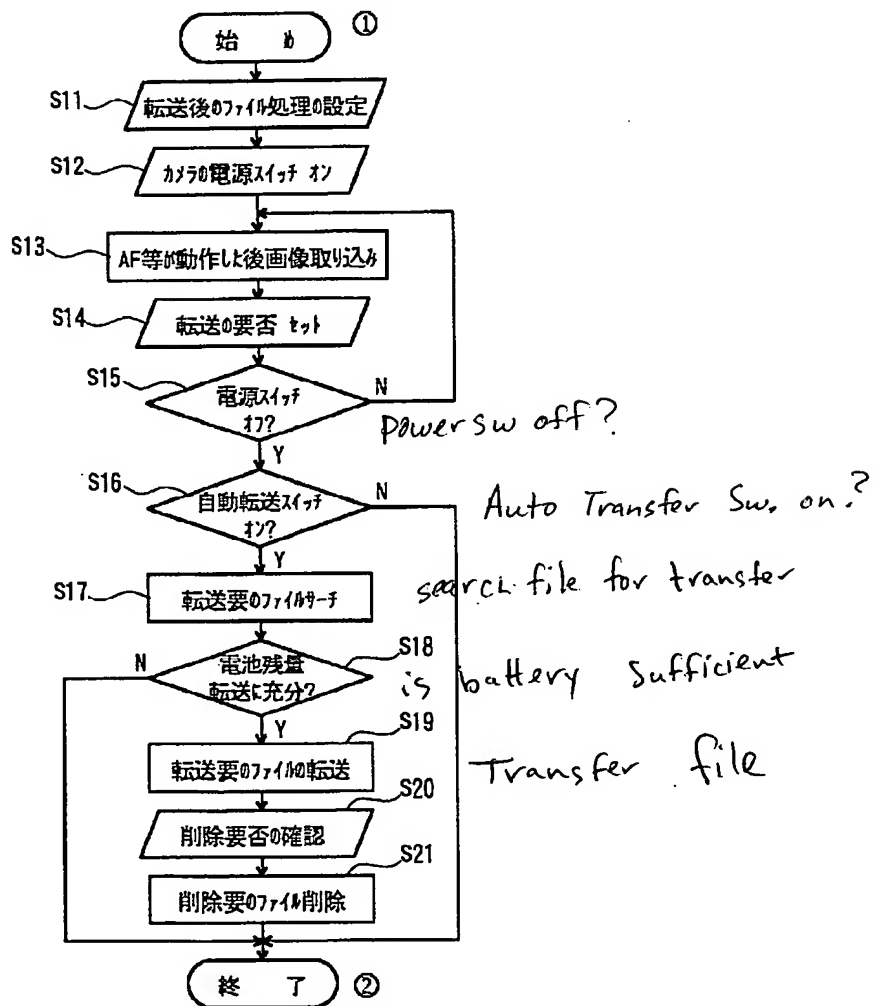


Figure 4:

1. Start

2. End

S11 File processing setup after the transfer

S12 Power switch On of camera

S13 Image introduction after the operation of AF, etc.

S14 Setup whether or not the transfer is required

S15 Power switch Off?

S16 Automatic transfer switch On?

S17 Search of the file whose transfer is required

S18 Is the remaining amount of battery sufficient for the  
transfer?

S19 Transfer of the file whose transfer is required

S20 Confirmation whether or not the erasure is required

S21 Erasure of the file whose erasure is required